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hydroxide-resistant material to a second aluminum layer of the web disposed on a second surface of the substrate, the second surface of the substrate being opposite the first surface and the second patterned layer substantially defining at least the first functional feature part; continuously passing the web in an immersed condition through a bath of aqueous sodium hydroxide based solution to effect removal of aluminum from areas of the web not protected by the first and second patterned layers; and washing the first and second aluminum layers free from spent sodium hydroxide based solution.

REMARKS

This document is a preliminary amendment. To the knowledge of the undersigned, no Office action has yet been mailed.


The purpose of this preliminary amendment is to augment the "Brief Summary of the Invention" section of the present application based on the language of the independent claims from the "Claims" section of the application as filed. As the preliminary amendment is fully supported by the claims as filed in the original application, no new matter is added. Entry of the preliminary amendment is respectfully requested.

As amended herein, the application is believed to be in condition for allowance, and a Notice of Allowability respectfully is requested.

The examiner is requested to call the undersigned if there are any questions about this matter.

Respectfully submitted,

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VERSION TO SHOW CHANGES MADE

[0010] These and other disadvantages sometimes encountered in using a liquid-based etch process in the fabrication of patterned webs that include thick conductive traces are overcome in the present invention, which in one embodiment is [] a metal-containing web for use in a liquid-based etch process to make product units, comprising an elongated substrate having first and second opposing surfaces; a first metal-containing layer disposed upon the first surface of the substrate; a first etch-resistant layer disposed upon the first metal-containing layer, the first etch-resistant layer having a first pattern substantially defining at least a part of at least a first functional feature of the product unit; a second metal-containing layer disposed upon the second surface of the substrate; and a second etch-resistant layer disposed upon the second metal-containing layer in register with the first etch-resistant layer, the second etch-resistant layer having a second pattern substantially defining at least the first functional feature part.

[0010.1] Another embodiment of the present invention is a metal-containing web for use in a liquid-based etch process to make a planar speaker diaphragm, the planar speaker diaphragm having at least one circuit trace having functional areas for interacting with an externally imposed magnetic field, comprising an elongated substrate having first and second opposing surfaces; a first metal foil layer disposed upon the first surface of the substrate; a first etch-resistant layer disposed upon the first metal foil layer, the first etch-resistant layer having a first pattern defining at least the functional areas of the circuit trace; a second metal foil layer disposed upon the second surface of the substrate; and a second etch-resistant layer disposed upon the second metal foil layer in register with the first etch-resistant layer, the second etch-resistant layer having a second pattern defining at least the functional areas of the circuit trace.

[0010.2] Another embodiment of the present invention is a metal-containing web for use in a liquid-based etch process to make an electronic circuitry surveillance device, the electronic circuitry surveillance device having at least one circuit trace having at least one inductor functional area and at least first and second charge storage functional areas, comprising an elongated substrate having first and second opposing surfaces; a first metal foil layer disposed upon the first surface of the substrate; a first etch-resistant layer disposed upon the first metal foil layer, the first etch-resistant layer having a first pattern defining at least the inductor functional

area and the first charge storage functional area; a second metal foil layer disposed upon the second surface of the substrate; and a second etch-resistant layer disposed upon the second metal foil layer in register with the first etch-resistant layer, the second etch-resistant layer having a second pattern defining at least the inductor functional area and the second charge storage functional area.

[0010.3] Another embodiment of the present invention is a planar speaker diaphragm comprising a substrate having first and second opposing surfaces; and at least one circuit trace, the circuit trace having a first metal-containing part disposed upon the first surface of the substrate and a second metal-containing part disposed upon the second surface of the substrate in a substantially opposing relationship.

[0010.4] Another embodiment of the present invention is an electronic circuitry surveillance product comprising a substrate having first and second opposing surfaces; an inductor trace, the inductor trace having a first metal-containing part disposed upon the first surface of the substrate and a second metal-containing part disposed upon the second surface of the substrate in a substantially opposing relationship; a first charge storage patch disposed upon the first surface of the substrate and coupled to the inductor trace; a variable impedance element disposed upon the second surface of the substrate and having a first end and a second end, the first end of the variable impedance element being coupled to the inductor trace; and a second charge storage patch disposed upon the second surface of the substrate and coupled to the second end of the variable impedance element.

[0010.5] Another embodiment of the present invention is a method for demetallizing a web to make a product unit, comprising applying a first etch-resistant pattern to a first metal-containing layer of the web, the first metal-containing layer being disposed on a first surface of a substrate of the web, and the first pattern substantially defining at least a part of at least a first functional feature of the product unit; applying a second etch-resistant pattern to a second metal-containing layer of the web, the second metal-containing layer being disposed on a second surface of the substrate opposite the first surface, and the second pattern substantially defining at least the first functional unit part; exposing both sides of the web to a liquid etchant to effect removal of metal-containing material from areas of the web not protected by the first and second etch-resistant patterns; and washing the etchant from the web.

[0010.6] Another embodiment of the present invention is a method of effecting selective demetallization of a web containing a flexible substrate layer, the method comprising applying a first patterned layer of sodium hydroxide-resistant material to a first aluminum layer disposed on a first surface of the substrate, the first patterned layer substantially defining at least a part of at least a first functional feature of the product unit; applying a second patterned layer of sodium hydroxide-resistant material to a second aluminum layer of the web disposed on a second surface of the substrate, the second surface of the substrate being opposite the first surface and the second patterned layer substantially defining at least the first functional feature part; continuously passing the web in an immersed condition through a bath of aqueous sodium hydroxide based solution to effect removal of aluminum from areas of the web not protected by the first and second patterned layers; and washing the first and second aluminum layers free from spent sodium hydroxide based solution.

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